Problem 1

Problem 2

Problem 3

Let $\mathbf{x} \in \mathbb{R}^5$ hold the movie ratings given by Leslie.
By the SVD projection in concept space we have

$$\mathbf{v} \cdot \mathbf{x} = [1.74, 2.84]^\intercal$$

By SVD decomposition and reconstruction of the input using the projected space we have

$$[1.74, 2.84]^\intercal \cdot \mathbf{v}^\intercal = [1.0092, 1.0092, 1.0092, 2.0164, 2.0164]^\intercal$$

E.g. we can predict Leslie to rate Titanic movie with 2.0164.

Problem 4

See below.